Precision of GPS point positioning -part7- Atmospheric expansion by solar radiation

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[1] None

http://home.att.ne.jp/iota/bluedoor2001/index33.html

Atmospheric refraction of GPS radio wave is expectedly influenced by (1).atmospheric tide (2).atmospheric expansion by solar radiation. I presented about (1) at the same convention on May, 2004. This study is about (2).

Using GPS point positioning data at a fixed point in Odawara-city, Kanagawa Prefecture, from December 2002 to September 2005, spatial 3D components of solar radiation were calculated using right ascension and declination data of the sun in Rika-nenpyo (edited by National Astronomical Observatory, Japan).

Correlation analysis between each component of solar radiation and GPS data suggested that GPS positioning data was correlated to solar radiation seasonally.

Similar to the case of atmospheric tide, the correlation coefficient above was correlated to the running average of the concentration of atmospheric pollutions. That is to say, the atmospheric pollutions inhibit the correlation between GPS data and atmospheric refraction of radio wave.

From above results it is possible that the atmospheric expansion by solar radiation influences GPS point positioning data, but other factors are expected to have relation to. After this it is necessary to analyze from various angles.